

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IN2004/000318

International filing date (day/month/year)
12.10.2004

Priority date (day/month/year)
21.10.2003

International Patent Classification (IPC) or both national classification and IPC
D06B3/02

Applicant
THE ARVIND MILLS LTD.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

10/2/6490
International application No.
PCT/IN2004/000318

IP20 Rec'd PCT/PTO 20 APR 2006

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IN2004/000318

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☒ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☐ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
 - ☐ the parts relating to claims Nos.

Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-9,11,15-21
	No: Claims	10,12-14
Inventive step (IS)	Yes: Claims	1-9
	No: Claims	10-21
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

PCT/IN2004/000318

Re Item IV

Lack of unity of invention

The separate inventions/groups of inventions are:

1. Claims: 1-16

Apparatus and method for dyeing fibres using a supporting system for carrying the fibres

2. Claims: 17-20

Method for dyeing fibre in the form of a roving or of a tow of filaments

3. Claim : 21

Method for preparing yarn

1. These inventions or groups of inventions are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons.
2. The document DE 30 45 647 A (D3) discloses an apparatus for dyeing fibres comprising a prewetting trough (see page 38, lines 4-9), a dye bath (reference 12) and a drying arrangement (see page 42, lines 18-23).
- 2.1 The subject-matter of independent claim 1 differs from this known apparatus principally in that it comprises a supporting system for carrying and dyeing the fibres continuously and homogeneously. This feature may be considered to be the special technical feature in the sense of Rule 13.2 PCT of the first invention or group of inventions.
- 2.2 The problem to be solved by these special technical features may be regarded as to

facilitate the transport of loose fibres through the apparatus.

3. The document D3 also discloses a method for dyeing fibre comprising the steps of prewetting, dyeing and drying the fibre in the form of yarn, wherein the fibre is dyed continuously.
- 3.1 The subject-matter of independent claim 17 differs from this known method in that the fibre is formed into a roving and then prewetted, dyed and dried in this form, i.e. before the roving is spun into yarn. The subject-matter of independent claim 20 differs from this same known method in that the fibre is formed into a tow of filaments and then prewetted, dyed and dried in this form, i.e. before the filaments are spun into yarn. These features may be considered to be the special technical features of the second invention or group of inventions.
- 3.2 The problem to be solved by these special technical features may be regarded as to permit sufficient penetration of the dye into the core of the subsequently produced yarn.
4. The document D3 does not disclose a method for preparing yarn.
- 4.1 All the features of independent claim 21, namely the blending of differently dyed and undyed fibres and spinning indigo melange yarns directly from these blended fibres, may therefore be considered to be the special technical features of the third invention or group of inventions.
- 4.2 The problem to be solved by these special technical features may be regarded as to provide a method for preparing indigo melange yarn.
5. The three inventions or groups of inventions thus have special technical features which are not the same and which do not correspond since they solve different technical problems. Hence the application does not meet the requirements of unity of invention according to Rules 13.1 and 13.2 PCT.

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:
 - D1 US 5 917 118 A
 - D2 GB 829 835 A
 - D3 DE 30 45 647 A
 - D4 US 3 835 490 A
 - D5 CH 612 557 A
 - D6 US 3 787 182 A
 - D7 US 4 248 592 A
 - D8 US 3 107 397 A
 - D9 US 1 717 633 A
2. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document) an apparatus for dyeing fibres comprising a dye bath (60), a drying arrangement (50) and a supporting system (61) for carrying and dyeing the fibres continuously and homogeneously.
 - 2.1 The subject-matter of claim 1 differs from this known apparatus principally in that it comprises a plurality of prewetting troughs.
 - 2.2 The subject-matter of claim 1 is therefore new (Article 33(2) PCT).
 - 2.3 The problem to be solved by the present invention may be regarded as to improve the dyeability of the fibres.

- 2.4 The solution to this problem of providing a plurality of prewetting troughs proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) because it is neither known from, nor rendered obvious by, the available prior art.
3. Claims 2-9 are dependent on claim 1 and as such these claims also meet the requirements of the PCT with respect to novelty and inventive step.
4. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 10 is not new in the sense of Article 33(2) PCT.
 - 4.1 The document D2 discloses a method for dyeing fibres comprising carrying the fibres using a supporting system (implicit in the disclosed method), prewetting the fibres along with the supporting system (see page 1, lines 70-71), dyeing the fibres along with the supporting system (see page 1, lines 73-75) and drying the fibres (see page 2, lines 4-5), wherein the dyeing of the fibres is continuous and homogeneous.
 - 4.2 The subject-matter of claim 10 is therefore not new (Article 33(2) PCT).
5. Dependent claims 11-16 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step because they are disclosed in the following documents (see the passages cited in the search report).
 - 5.1 Document D2 discloses the features of claims 12-14 in combination with the features of claim 10.
 - 5.2 Document D1 discloses the features of claims 11-13 and 15.
 - 5.3 Document D3 discloses the features of claims 12,13,15 and 16.
6. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17 does not involve an inventive step in the sense of Article 33(3) PCT.

- 6.1 The document D4 is regarded as being the closest prior art to the subject-matter of claim 17 and discloses (see claim 1) a method for dyeing fibre comprising the steps of forming a roving form of fibre (implicit in the disclosed method), dyeing the fibre in roving form and drying the fibre in roving form, wherein the fibres are dyed continuously and homogeneously.
- 6.2 The subject-matter of claim 17 therefore differs from this known method in that the fibre in roving form is prewetted before dyeing.
- 6.3 The problem to be solved by the present invention may therefore be regarded as to improve the dyeability of the fibre.
- 6.4 The solution proposed in claim 17 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) because the feature of prewetting before dyeing is described in document D5 in order to improve the dyeability of fibre in the form of yarns. The skilled person would regard it as a normal option to include this feature in the method described in document D4 in order to improve the dyeability of fibre in roving form since there is no essential difference between the techniques required for the dyeing of yarns and those required for the dyeing of rovings.
7. Dependent claims 18 and 19 do not contain any features which, in combination with the features of claim 17 meet the requirements of the PCT in respect of inventive step because the features of these claims are disclosed in both D4 (see claim 7) and D5 (see page 3, column 1, lines 58-62).
8. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 20 does not involve an inventive step in the sense of Article 33(3) PCT.
- 8.1 The document D6 is regarded as being the closest prior art to the subject-matter of claim 20 and discloses (see column 1, lines 11-24) a method for dyeing fibre comprising the steps of forming a tow form of filaments, prewetting the filaments in tow form and dyeing the filaments in tow form, wherein the filaments are dyed

continuously and homogeneously.

- 8.2 The subject-matter of claim 20 therefore differs from this known method in that the filaments in tow form are dried after dyeing.
- 8.3 This drying step comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claim 20 lacks an inventive step (Article 33(3) PCT).
9. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 21 does not involve an inventive step in the sense of Article 33(3) PCT.
- 9.1 The document D7 is regarded as being the closest prior art to the subject-matter of claim 21 and discloses (see column 2, lines 41-47) a method for preparing yarn comprising the steps of blending dyed fibres with undyed fibres and spinning melange yarns directly from dyed fibres.
- 9.2 The subject-matter of claim 21 therefore differs from this known method in that the blended fibres are an indigo melange.
- 9.3 The problem to be solved by the present invention may therefore be regarded as to produce indigo melange yarns.
- 9.4 The solution proposed in claim 21 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) because the blending of appropriately coloured fibres in order to produce indigo melange yarns comes within the scope of the customary practice followed by persons skilled in the art.
- 9.5 Claim 21 also lacks an inventive step over the disclosure of document D8 or over the disclosure of document D9.